REMARKS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 7-19 are presently pending in the present application. Claim 7 has been amended and Claims 10-19 have been added by way of the present Amendment. Care has been taken such that no new matter has been entered. Support for the new claims can be found in the original claims, drawings, and written description, for example, on page 15, lines 6-10, and on page 23, lines 15-17.

Claims 1-6 were withdrawn as being directed to a non-elected invention. Claims 1-6 have been canceled without prejudice or disclaimer. The Applicants reserve the right to file one or more divisional application directed to canceled, withdrawn, non-elected Claims 1-6.

In the outstanding Official Action, Claims 7-9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Park et al. (U.S. App. Pub. No. 2002/0034857). For the reasons discussed below, the Applicants respectfully traverse the obviousness rejection.

The basic requirements for establishing a *prima facie* case of obviousness as set forth in MPEP §2143 include (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, (2) there must be a reasonable expectation of success, and (3) the reference (or references when combined) must teach or suggest <u>all</u> of the claim limitations. The Applicants submit that a *prima facie* case of obviousness has not been established in the present case because the reference does not teach

or suggest all of the claim limitations, and there is no suggestion or motivation to modify the reference to arrive at the claimed invention.

Claim 7 of the present application recites a processing method for processing an object comprising, among other features, introducing a processing gas through a plurality of gas jetting holes into a processing chamber, wherein while processing the object, a head distance between a gas jetting surface and a mounting table and a gas jetting velocity from the gas jetting holes are restricted to be within an area in a plane coordinates system having the head distance as a horizontal axis and the gas jetting velocity as a vertical axis, the area being surrounded by a quadrilateral shape formed by straight lines connecting four points including a point where the gas jetting velocity is 32 m/sec and the head distance is 15 mm; a point where the gas jetting velocity is 67 m/sec and the head distance is 15 mm; a point where the gas jetting velocity is 40 m/sec and the head distance is 77 mm; and a point where the gas jetting velocity is 113 m/sec and the head distance is 77 mm. The Park et al. reference fails to disclose or even suggest such features.

The Park et al. reference describes methods of forming Ta_2O_5 layers in a process chamber by maintaining the Ta_2O_5 layer at a first temperature that is less than a temperature for crystallization of the Ta_2O_5 layer, where at least one of a position of the Ta_2O_5 layer in the process chamber relative to the heater and a pressure in the process chamber is changed to increase the temperature of the Ta_2O_5 layer to about the temperature for crystallization. Thus, the Park et al. reference teaches controlling of the wafer temperature by (1) adjusting the position of the wafer in the process chamber relative to the heater (note that the Park et al. reference is teaching the use of relative positions of or distance between the wafer and the

heater (14) to control temperature of the wafer, and not the distance between the stage (31) and the showerhead (21)), (2) by adjusting the pressure in the process chamber, or (3) by a combination of changes in the wafer position relative to the heater, and changes in the chamber pressure. (See, e.g., Figures 3 and 4, and paragraph [0042].)

As noted in the Official Action, the Park et al. reference does not disclose the claimed area defined by the recited head distance/gas jet velocity points. But rather, the Official Action relies upon an assertion that the head distance and the gas jet velocity are taught to be result-effecting variable in the Park et al. reference, and thus concludes that the claimed ranges would have been obvious to one of ordinary skill in the art through routine experimentation, absent the showing of evidence showing the criticality of the variables commensurate in scope with the claims. The Applicants respectfully traverse the assertion that such variables are taught as being result-effective variables in the Park et al. reference, and traverse the conclusion that the claimed ranges would have been obvious to one of ordinary skill in the art, for the reasons discussed below in detail. Additionally, the Applicants note that the specification of the present application clearly provides evidence of the criticality of the claimed ranges, as is evident from a review of page 5, line 20, through page 25, line 11, and Figures 4-9 of the present application.

Regarding the assertion in the Official Action that the gas jetting velocity in Claim 7 is taught as being a result-effective variable in the Park et al. reference, the Park et al. reference provides no such teaching. In fact, the Park et al. reference never even mentions gas jet velocity, and certainly never discusses the effects such a variable can have on the process described therein. The Official Action suggests that the teaching of chamber

pressures in the Park et al. reference inherently includes a teaching of gas velocities. However, this conclusion is erroneous. The gas jetting velocity is determined by parameters, such as, gas flow rate at an inlet port, and number and size of gas jetting holes. Accordingly, the gas jetting velocity can be varied even when the gas flow rate at the inlet port, and therefore the pressure inside the chamber, remains identical. Furthermore, even when the gas jetting velocity is determined only by the gas flow rate at the inlet port, adjusting a gas flow rate at an outlet port together with that at the inlet port would cause the pressure inside the processing chamber to be maintained constant, while the gas jetting velocity is varied. Thus, the teaching in the Park et al. reference of adjusting the pressure in the process chamber does not inherently teach that the gas jetting velocity is a result-effective variable.

Regarding the assertion in the Official Action that the head distance in Claim 7 is taught as being a result-effective variable in the Park et al. reference, the Park et al. reference never teaches that the distance between the showerhead (21) and the stage (31) is a result-effective variable, but rather discusses the use of relative positions of or distance between the wafer and the heater (14) to control temperature of the wafer. The distance between the showerhead (21) and the stage (31), however, is not taught as a way to control the temperature of the wafer.

MPEP §2144.05 states that "[a] particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation." As the Park et al. reference does not teach that the gas jetting velocity and head distance are result-effective variables, the conclusion that the "area" recited

in Claim 7 would have been obvious to one of ordinary skill in the art based on routine experimentation is erroneous.

The specification of the present application clearly provides evidence of the criticality of the claimed ranges, as is evident from a review of page 5, line 20, through page 25, line 11, and Figures 4-9 of the present application. For example, the specification indicates that by restricting the relationship between the head distance and gas jetting velocity to within the shaded area depicted in Figure 3, a wafer can be processed in a highly uniform manner, with improved processing efficiency, and improved throughput.

Therefore, the head distance and gas jetting velocity relationship defined in Claim 7 is critical in achieving advantageous results using variables and a relationship that the Park et al. reference did not recognize or even suggest, and thus it would not have been obvious to one of ordinary skill in the art at the time of the present invention to arrive at the claimed invention through routine experiments.

Accordingly, the Applicants submit that a *prima facie* case of obviousness has not been established for independent Claim 7. Therefore, the Applicants respectfully request the withdrawal of the obviousness rejection of Claim 7.

Claims 8-11 are considered allowable for the reasons advanced for Claim 7 from which they depend. These claims are further considered allowable as they recite other features of the invention that are neither disclosed nor suggested by the applied references when those features are considered within the context of Claim 7.

Newly added Claims 12-19 are believed to be in condition for allowance as they recite features that are not disclosed or suggested by the cited art. For example, independent Claim

12 recites a processing method comprising, among other features, injecting a processing gas into a processing chamber while restricting a distance between the gas jetting surface and the mounting table and a velocity of the processing gas from the plurality of gas jetting holes to be within an area.

Consequently, in view of the above discussion, it is respectfully submitted that the present application is in condition for formal allowance and an early and favorable reconsideration of this application is therefore requested.

Respectfully Submitted,

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